[특별기고]

The Gods of the Fourth Industrial Revolution*

–Philosophies and Religions in the Age of Deep Learning–

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【요약문】 시대의 징표를 읽는 것은 모든 종교의 중심 임무로 간주되어왔다. 특히 역사의 종말을 향해 정위된 종교들에게는 더 그러하다. 클라우스 슈바브는 동물과 기계 사이의 간극에 다리를 놓는 신흥 기술을 '4차 산업혁명'으로 파악했다. 여러 산업 혁명은 여러 철학을 동반하며, 전통적 종교에 중대한 영향을 미친다. 3차 산업 혁명의 신은 '시장'과 '개인'이지만, 전통적 종교의 임무는 이러한 우상숭배 형태로서의 유사–종교에 대한 신학적 비판을 제공하는 것이다. 딥 러닝을 통한 인공지능은 자연지능을 대체할 수 있는 것으로 간주될 것이다. 그러나 여기서 발생하는 문제들은 종교의 지혜를 사용하는 과학과 인문학 사이의 대화 속에서 해결될 수 있다. 따라서 가장 중요한 것은, 인간 피조물이 신과의 교류 속에서 신에 의해 완성되어야 한다는 점이다.

【주제어】 산업혁명, 4차 산업혁명, 전통적 종교, 딥 러닝, 인공지능

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1. Industrial Revolutions and their Social and Psychological Implications

1) Reading the signs of the times has been regarded as a central task for all religions, perhaps especially for those religions which are directed towards an end of history. "Philosophy", says the philosopher Georg Wilhelm Friedrich Hegel, "is its own time comprehended in thought." The task of reflecting on the changes that occur in our present therefore seems inevitable both for philosophy and theology. This requires that the "ultimate questions" which are the realm of both religion and philosophy are identified in the fleeting, changing penultimate concerns of our ever changing present and are presented for consideration - in theologies and philosophies, but also in the wider contexts of our societies.

There is a genre of literature that is dedicated to analysing the present in which we live, the characteristics of particular generations of people belonging to a certain age group, the major trend in political, social and technological developments, what we might expect and what we might hope for. Humans are constantly in need to find orientation in their specific situation, to ask where they come from and where they might be going to, to make the present in some way transparent to them. The situation in which we live is not self-explanatory to us, we need reflective distance to assess it properly.

Interpreting the signs of the times is also particular characteristic of many of the sacred texts in the religious traditions. If we look at the Hebrew Bible we find that stories are told in which the present of the people of Israel is reflected and connected to its beginnings and to its destiny. In the New Testament such comments, which we find in the Gospels as well as in the Epistles, mirror the specific situation of the early Christian communities, expecting the Second Coming of Christ as the end of the story that began with the creation of the world. The story of Israel is read as a promise pointing to the fulfilment of the promise in Christ, and

the Christian church is presented as being on the way, a pilgrim people on its way through history and reading the signs of the times as pointing to the goal of history. It is not different in the Qur'an where there is often a concrete situation for the sending down of particular suras. The recitation and the exegesis of sacred scriptures in this way serve as a tool of analysing the situation of the hearers of the message by putting it in the overall narrative framework or scheme of guidance of God for humans on their way through life. It is characteristic of religious texts in the monotheistic religions that they understand a particular situation by placing it in the context between the first beginning and the final end, or the universal destiny of humanity and its ultimate norms.

When Georg Wilhelm Friedrich Hegel described philosophy as "its own time comprehended in thought" in the famous "Preface" to his *Philosophy of Right* it is clear that he stands in this tradition of making sense of the present by identifying its underlying dynamics, the forces and factors that have led to this situation and the ultimate logic of the development of which we are part. Hegel is justly famous for having developed the first metaphysics of history, an attempt to show that metaphysical principles and the contingencies of the historical process are not mutually exclusive. Understanding one's own time is a genuine philosophical task. It is not only a task for historians, but also for metaphysicians who ask ultimate questions with regard to the penultimate situation in which we live. Philosophy is not concerned with abstract metaphysical principles or with the methods and norms of particular fields of enquiry. The task of philosophy is to make our own time transparent for us, just by reflection on ultimate questions, like the question of the ultimate destiny of humans, of the constitutive elements of human sociality, of the ground of all being and becoming. Only in this way philosophy can truly be a theory of reality as the reality we inhabit in our specific times. It produces a set of coordinates for reflection and action by relating relative elements to the Absolute. The vital questions of today, how they relate to yesterday and to which tomorrow they point, are therefore genuine theological and philosophical questions, questions that are

too important to be left to the specialists of always increasingly smaller fields of inquiry and investigation. “Only connect” - E. M. Forster’s motto is therefore not a bad guide for trying to read the signs of the times.

2) The character of our present time has been characterized by the founder and executive chairman of the World Economic Forum, Klaus Schwab, as the “the fourth industrial revolution” characterized by extensive progress in emerging technologies that bridge the gap between animals and machines: artificial intelligence, robotics, cyberphysical systems, 3D printing and the internet of things. While the first industrial revolution is understood as the transition from agrarian societies to industrial societies which has as its emblem the steam engine, the second industrial revolution in the decades before the First World War is characterized by the use of electricity in mass production, wired and wireless communication and has as its emblem the internal combustion engine. We live in the age of the third industrial revolution, the digital revolution, starting in the 1950ies and spreading exponentially since the 1980ies, characterized by the transition from analogical technical devices to digital devices. It has as its symbol the personal computer and the smart phone. These revolutions cannot be appropriately considered without their social and psychological consequences and implications: the pauperization of the proletariat for the first revolution; the wars of competing hegemonic claims characterizing the second revolution, intrinsically connected with both world wars; the dominance of digital communication systems in all market-type exchanges, creating the universal convertibility of all goods and values by means of algorithms and leading, as some critics claim, to “digital dementia”. What are the social and psychological consequences of the fourth industrial revolution?

It is a convenient way of naming the present to describe it as a series of revolutions. Speaking of a revolution implies that the new era cannot be understood as a extension of the former times. The past and the present are connected through a turnover, an upheaval bringing in new factors that

shape the present on the course to the future. Therefore, revolutions cannot be predicted, one can only point to the factors that were perhaps already there but become effective by being applied to new fields. The first industrial revolution as the transition from predominantly agrarian rural societies to industrial urban societies makes use of what was already known of the laws of mechanics and applies them to the production of goods, to farming and to travel and so triggers a new way of life. The economy is always the multiplying factor that communicates new ways of working and living in many interconnected places, made possible by free trade agreements. The emblem of the first industrial revolution is the steam engine since it could be deployed in many different forms in many areas of the production of goods. The dissolution of the old order of society and the creation of a new structure of society always seems to create a period of almost chaotic circumstances which then have to be regulated once they are there. The new ways of producing wealth also produced new forms of psycho-social impoverishment in its most dramatic forms which could only be contained by interventions from the state and the help of the churches, voluntary organisations and charities.

The second industrial revolution is commonly associated with the decades immediately before the First World War. The use of electricity changed the modes of production, wired and unwired communication systems brought distant places closer together. By this development the economy speeded up tremendously and distant suppliers and goods could be connected to markets by means of new communication systems like the telegraph and the telephone. The invention of the internal combustion engine, perhaps also the emblem of the era, also for private transport leads to a development with the most far-reaching consequences, socially, economically and ecologically. One could well argue that the achievements of the second industrial revolution form the background of the hegemonic conflicts of competing imperial powers that resulted in the First World War. The correlation between mass production and mass warfare is as obvious as it is frightening.

We live in the last phases of the third industrial revolution and on the brink of the fourth industrial revolution. This phase is characterized by the transition from analog to digital devices. The replacement of continually changing electric tension to the transmission of numerical values leads to simplification, a dramatic decrease in size, the equalization of all electrically based processes which through digital codes acquire the capacity of connecting every technical device with another. While many of the seminal ideas go back to the 1950ies Alan Turing's paper "Computing Machinery and Intelligence"[1] is one of the canonical texts of the third and the fourth industrial revolution. The expansion of digital modes of communication has taken over since the 1980ies. The internet dominates all our lives in all its different spheres, our professional lives as well as our private lives. Being able to deal with forms of communication that we understand only in the most marginal way has become the key competence for living in today's world. Our dependence on the technical devices we constantly use, laptop, tablet and smart phone, makes it difficult to imagine doing without them. Personal forms of social interaction, requiring our bodily presence, are to a large extent replaced by virtual forms of social interaction. Who are we, our bodily, spatio-temporally located presence for other persons, or our avatar created by ourselves according to rules of which we know nothing by Facebook or Google? As our capacities for communication and interaction increase exponentially through intelligent devices, our natural intelligence seems to be seriously harmed by constant use of digital media. In Korea psychiatrists first diagnosed "digital dementia", a loss of fundamental mental skills in young people spending more than half of the day using electronic media. We seem to be caught in a dilemma: Without the use of intelligent devices we can not function in our social context, but precisely this use incapacitates our mental capacities.[2] Again it is the

1) Originally published in: *Mind*, 59 (236) 1950, 433-460쪽. Now with Turing's other writings in: B. Jack Copeland (ed.), *The Essential Turing: Seminal Writings in Computing, Logic, Philosophy, Artificial Intelligence, and Artificial Life plus The Secrets of Enigma*, 2004.

2) Cf. Spitzer, M., *Digitale Demenz*, 2012.

economy that has been the driving forces of this industrial revolution. Stock markets nowadays depend on high frequent trading, utilizing minimal time differences in different parts of the globe to make maximum profits.

The fourth industrial revolution has, according the experts, already begun. The technologies are already in place and speed up the work in artificial intelligence, nanotechnology, robotics and intelligent biotechnology. We have already become transparent with our preferences, likes and dislikes by the the internet service we use, like Facebook, Amazon or Google and they are already manipulating what we think are our personal free choices and personal preferences. One of the most fascinating books on this development, written by a pioneer in Artificial Intelligence, Jerry Kaplan, has the ominous title *Humans Need not Apply*.[3] In this work he draws a gloomy picture of the coming collapse of the human labour market as human skills are replaced by synthetic intelligence. An era of dramatic inequality is on our doorstep, creating a deep divide between those who have the capital to make most use of synthetic intelligence at the expense of those who are at the receiving side of the achievements of synthetic intelligences and forged labourers. Will the institutions of democracy be able to deal with this change in our society? Will the legal system find ways of dealing with intelligent robots? Where do they find their place between persons and things? Will they have access to the ownership of property and perhaps introduce a way in which they can employ humans? Can fundamental human rights be protected against being undermined by the more and more competent and independent creations of the human mind?

2. The Philosophies and the Religions of the Industrial Revolutions

3) The industrial revolutions are accompanied by philosophies that both provide the background of these revolutions and mirror their effects. The first industrial revolution would be unthinkable without the philosophies of progress, developed in the Enlightenment and the mechanistic world-view

3) Kaplan, J., *Humans Need not Apply*, 2015.

of early modern scientific thought. The second industrial revolution mirrors the categories of evolutionary thought, both in its biological (Charles Darwin) and its sociological variety (Herbert Spencer). For the third industrial revolution large-scale economic theories (Friedrich von Hayek) and rational choice theory, together with philosophies of liberalism provide the background ideologies. Managing the effects and after-effects of the respective industrial revolutions will only be possible on the basis of a critical assessment of their philosophical presuppositions and effects.

Telling the story of the industrial revolutions in this way seems to suggest that there is a certain necessary logic in these industrial revolutions. They seem to be part of an overall cultural evolution, inevitably drawing humans along in a process they can less and less influence and steer. Much speaks for this view, especially since in the last phases theories were developed that describe the logic of this evolution in terms of the autopoietic capacities of the economic evolution, already contained in Adam Smith's belief in the providential capacities of the "invisible hand". However, if one looks closely there is no automatism that one revolution inevitably leads to next. The different revolutionary turns depend on the beliefs of the members of a society about the nature of humanity and the aims of human life, both individually and socially. This pertains to those initiating new developments as well as to those who often less than voluntarily have to accept them. There is clearly an uneven distribution of power. Those who can expect to profit most, not only in material terms but also in terms of social recognition or status, will be more keen to support the new developments than those who must fear to experience loss. Since all the developments are related to the development of the economy, one must recognise that there is no democratic control of economic power. The uneven distribution not only of the power over capital, labour, resources and knowledge but also the power to achieve certain ends belongs to the very nature of the economy. Furthermore, with the first industrial revolution the modes of distribution change. They are no

longer dependent on inherited possessions but increasingly on economic success itself, i.e. on the way the new technological means are employed to increase the profits of those who own them. Nevertheless, although the developments constituting the successive revolution are always mediated through the economic system, and increasingly so from one revolution to the next, they nevertheless are dependent on guiding ideas which motivate the respective enterprises in the first place. Such guiding ideas are not only scientific beliefs and knowledge of engineering but also beliefs about the destiny of what it means to be human, about the best form of human society, about human flourishing individually and socially. One could call such ideas meta-scientific ideas because they do not strictly belong to the realm of science but are philosophical or religious in character. They go beyond what can be tested mathematically or empirically, but they very much influence what one might want to test mathematically or empirically.

It seems plausible to assume that the ideas augmenting the first industrial revolution were not only the laws of mechanics, necessary to build a steam engine and design a mechanical loom, but also the belief that humans are creative beings with skills for the development and employment of ever better tools. Furthermore, it seems that the Enlightenment view that what humans can be is not determined by tradition, by their past history, but rather by the future they themselves make happen, is presupposed in the industrial revolution. Since the Enlightenment humanity has become its own project, pushing itself from one step to the next on the road of progress by the firm belief in the perfectibility of man.[4] Where this belief is held it is almost natural that the steps promising progress will be supported. With hindsight we have come to realize that this belief has also offered justifications for the most cruel experiments on humans, be it in education or in the social sphere.

Looking at the second scientific revolution one cannot help but suppose that the hegemonic competition of imperialist powers is also, albeit only

4) Cf. Passmore, J., *The Perfectibility of Man*, 3rd edition New York: Scribner's, 2000. and Robert Nisbet, *The Idea of Progress*, Basic Books, 1980.

indirectly, supported by some sort of receptions of Darwinian ideas. The different expressions of the sub-title of Darwin's *On the Origin of Species* (1859) "by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life" seem to provide the key-phrases for the political, military and economic rhetoric of the time. The sociological version of evolutionary theory in the work of Herbert Spencer who was more influenced by Lamarck and had therefore more faith in the way humanity could be shaped by environmental factors may also have contributed to a mind-set, focused on "the struggle for life" and the "survival of the fittest". The idea of progress becomes a competitive ideal between nations, even between "races", once the concept was transferred from biology to social theories. The connection between technological developments, military endeavours and colonialist policies is tangible.

The philosophical background of the third scientific revolution is less easy to grasp. Would it be wrong to see the connection here mainly between technological developments and theories in macro-economics and radical libertarian social philosophies? The stock exchange has not only become the most effective and fastest communication system that influences all fields of society. It is also the symbol of the universal convertibility of knowledge into prices and ultimately into stock prices so that it functions as a most powerful coordinator of actions of individual and social agents. "In a system in which knowledge of the relevant facts is dispersed among people, prices can act to coordinate the separate actions of different people", is the quasi-creedal statement by Friedrich von Hayek that underlies the practical philosophy of the third industrial revolution. What happens if it is not knowledge of relevant facts but opinions, alternative facts and fake news that act to coordinate actions between people?

What are the philosophical background beliefs that underlie the fourth industrial revolution? I cannot point to a specific philosophical system that would provide the background philosophy for the fourth industrial revolution. In many ways philosophical theories no longer seem to provide prospective views of where humankind should go, but rather have a

retrospective role in reflecting on what has already happened, sometimes rather mournful lament that the internet has dethroned philosophy. There are however, two characteristics that have to be noted. There is general blurring of fixed categories, a sort of horizontal transcendence and permeability of categories. The boundary between animals and machines no longer seems to be clearly defined if both are understood as powerful algorithms. The boundary between human and synthetic intellects also seems to be blurred. If everything that exists is rooted in an algorithm and when life can be seen as a gigantic process of data-processing we seem to have arrived at the goal of all metaphysics to be able to think "the whole", however this "whole" no longer has orienting power for humans.

It is important to see that philosophical beliefs in a way are constitutive for processes like the industrial revolutions and also consequent upon them. What really happens changes the way we think about it. Nevertheless, the one advantage humans have over synthetic intellects is that they not only have intelligence, but also consciousness, embodied consciousness which accompanies all our acts of thinking, feeling acting and being in communication. The highest form of consciousness is that of persons in relation, the form of self-awareness that mediates identity and otherness. This is perhaps the most powerful resource humans have to remain at least critically and constructively involved not only as a patient but also as an agent in the fourth industrial revolution.

4) The various industrial revolutions had a significant effect on the traditional religions. They have also been accompanied by various "quasi-religions" where a finite entity becomes the centre of worship as a form of social practice. For the first industrial revolution one would probably have to name the idea of progress, together with a form of humanism as its characteristic quasi-religion. For the second industrial revolution it is the idea of power and the nation. Most probably, the "market" and "the individual" are the twin deities of the third industrial revolution. The task of the traditional religions is to offer a theological

critique of these quasi-religions as forms of idolatry.

The traditional religions have responded in many ways, actively and reactively, reflectively and practically, to the four industrial revolutions. If we just think of Christianity we only have to think of the forms of social engagement that the first industrial revolution triggered, the entanglement in nationalist religion in the second industrial revolution and the Christian movements for world peace which started in the same period. The third industrial revolution has produced both "prosperity theology" and some of the most far-reaching critiques of neo-liberalist capitalism. The response to the fourth industrial revolution is as yet quite unclear. One only has to trawl the internet in order to see that new forms of internet religion are quickly developing, be they Buddhist, Christian, Muslim, Hindu or Jewish. They have a plurality of forms, from very traditional platforms simply providing religious sources and theological texts to platforms of mediation and prayer and new forms of digital spirituality.

Although the picture is as yet unclear, one can however reflect what the resources of the religions are for reflecting critically on the different industrial revolutions. The most powerful instrument of criticism in the monotheistic religions is the distinction between the true God and the idols. If there is one attribute of the God of the Hebrew Bible it is that God is a jealous God who does not suffer idolators gladly. The New Testament extends this critique of idolatry not only to other deities but also to wealth ("No man can serve two masters: for either he will hate the one, and love the other; or else he will hold to the one, and despise the other. Ye cannot serve God and mammon." Matthew 6:24), to the "belly" ("whose God is the belly", Philippians 3:19) or what the old-fashioned word calls "fornication". Associating God with anything that is created (shirk) is the most deadly sin in Islam. Idolatry means in this context that something finite and created is worshipped as only the true infinite God, the creator of heaven and earth, should be worshipped. A finite entity is made the object of absolute and unconditional trust, love and hope.

The theologian Paul Tillich has applied the notion of idolatry to the analysis of modern ideologies which he calls "quasi religions", most notably fascism and communism. Whereas in "pseudoreligions" there is an intended similarity to religions, there is in quasi-religions an unintended similarity which can be identified by unintended similarities to theologies, liturgies, religious virtues, the absoluteness of religious devotion that is offered to a relative object. It is from these entities that the worship expects not only temporal blessings but eternal bliss and salvation. Can one identify similar quasi-religious elements in the four industrial revolutions? I suggest that the idea of progress and the humanist belief in the perfectibility of man are the twin objects of worship. For the second industrial revolution one could name power and the nation (perhaps race) as the objects of worship. In the case of the third industrial revolution we could possibly name the market and the individual as the two related foci of worship. Anyone who has ever watched the opening of the New York stock exchange on television will be surprised by the similarities to religious worship.

With regard to the market one can legitimately wonder whether it has become quasi-personalized through the quasi-religion of economism, to such an extent that we talk of the "behaviour" of the markets in quasi personal terms. "The markets reacted nervously…" "the market continued to be in optimistic mood …" Do we still notice what we are saying? Impersonal means of communication, operated by high frequency trading - a personal entity? However, when the markets get nervous, many people will also get nervous, and when the markets maintain an optimistic mood, so will many people. The market, however, is a capricious deity, so unpredictable that it is difficult to put trust in this God, let alone absolute trust. Furthermore, it is one of those deities which devour their children. In Europe it has already devoured bourgeois society which it once created.

The best critics of quasi-religions are the religions because they have a long history of trying to distinguish between the true infinite and absolute God and all other finite objects and they have experience with the consequences of idolatry in their own history. Idolatry can seriously damage

your well being and your health. Elevating finite objects to a status of infinite worth is harmful to human beings. Idols never set free, they maintain their hold on people until they collapse. This is where the critique of idolatry in theistic religions meets with the mystical religions of Asia who in a non-theistic fashion claim to offer liberation and release from bondage to the wrong objects of desire.

Who or what is the God of the fourth industrial revolution? With this question we turn to the book by the Israeli historian Yuval Noah Harari *Homo Deus*.

3. Homo Deus? - Reconsidering the Promise of the Serpent

5) While the most literature on the fourth industrial revolution focuses on the new technological developments the book by the Israeli historian Yuval Noah Harari *Homo Deus: A Brief History of Tomorrow* (2017) looks at these changes from an altogether different perspective: the perspective of a global history of the future of humankind. Like his book *Sapiens* charted the history from our earliest forebears in the human species to us, so his new book does not offer predictions but considers the possibilities that the new technological developments open up. After we have conquered famine, epidemics and war, there is now a new human agenda aimed at achieving immortality, happiness and, ultimately, divinity. The promise of the serpent in the Garden of Eden "Eritis sicut Deus" finally comes true, humans become divine and they no longer have a God to compare themselves to. Nietzsche's vision of the death of God has come true and the "overman" (der "Übermensch") appears. However, once they have become God, humans have also become obsolete to be replaced by a better functioning system of data processing. Nietzsche's second prophecy has also come true: "Man is something that shall be overcome."

With his book *Sapiens* the Israeli historian Yuval Harari has offered a

comprehensive history of the human species. Now he has written a history of tomorrow, applying a historical perspective to the future. History usually tells us how we have become what we are. Harari offers a scenario that presents us with a view of how we will become what we are not. He starts by laying out the "new human agenda". On the basis of a wealth of statistical material, he claims that humanity has overcome to most deadly threats to its existence in the past: famine, epidemics and wars. The famine that still exists - and Harari is clear that it is a dreadful scourge of humanity - appears just in terms of the numbers of earlier famine periods comparatively small. Today, in many countries, people are far more likely to die from overeating than from undernourishment. The epidemics of today, Ebola or AIDS, appear in terms of the sheer size small compared to the smallpox epidemics that Europeans brought to the pacific in the 16th century. And although there are still wars, they are regionally contained in comparison to the world wars of the 20th century. What are the aims humanity should now strive for?

Harari identifies three such aims that are already on the agenda not only of individuals but also of societies. The first is immortality, the abolition of death. Death has for late humans become a "technical problem", a "technical glitch" (HD 25) and for technical problems there are technical solutions which enable humans to postpone death for another decade and yet another decade. Happiness is both for many individuals the highest individual goal to pursue and, at the same time, the source of the most devastating crimes because of the wars conducted by rival drug dealers. The pursuit of happiness, originally included in the American Constitution to limit the power of the state is now understood as the right to happiness. On the basis of statistical factors about the increase of happiness inducing drugs in Western countries, he conjectures that humanity's way to happiness will be biochemically induced, "providing humans with an unending stream of pleasant sensations" (HD 48). He contrasts that to the Buddhist view of happiness which sees pleasant sensations as they arise and fall as "ephemeral and meaningless vibrations" (HD 49). The third

aspiration is the biggest one of all. Harari writes:

> In seeking bliss and immortality humans are in fact trying to upgrade themselves into gods. Not just because these are divine qualities, but because in order to overcome old age and misery humans will first have to acquire godlike control of their own biological substratum. (HD 49)

According to Harari, humans do not really attempt to become like the all-powerful God of monotheistic theologies, but they attempt to upgrade themselves so that they become functionally more powerful than the gods of old.

> So far we have competed with the gods of old by creating better and better tools. In the not too distant future, we might create superhumans who will outstrip the ancient gods not in their tools but in their bodily and mental faculties. If and when we get there, however, divinity will become as mundane as cyberspace - a wonder of wonders that we just take for granted. (HD 55-6)

Upgrading the homo sapiens into the homo Deus, however, will be a "gradual historical process" with the curious result that once it is completed the homo sapiens will be something to look back on. Was that what the temptation of the Serpent consists: You will be like God? Did the first humans realize that once the serpent's promise would be fulfilled, the "you" that was addressed in the promise would not be the "you" of the fulfilment of the promise? That is how Harari sees the future of homo sapiens:

> Homo sapiens is not going to be exterminated by a robot revolt. Rather, homo sapiens is likely to upgrade itself step by step, merging with robots and computers in the process, until our descendants will look back and realise that they are no longer the kind of animal that wrote the Bible, built the Great Wall of China and laughed at Charlie Chaplin's antics. (HD 56)

By now the full scale of the Nitzschean vision has become obvious. Once the project of upgrading is making real progress the humans we now are,

homo sapiens, will have morphed into something quite different. Can the promise to become like God be a real promise to the humans we are now, or rather the threat of the abolition of man? [5]

6) Harari sees two new religions on the horizon, "Techno-humanism" and "Dataism". Of these two Dataism is far superior, because it is not hampered by obsolete humanist convictions but sees humans simply as biochemical algorithms and human experiences as data patterns. This shift from a homo-centric to a data-centric view Harari calls a "tremendous religious revolution" (HD 453) based on the creed that if organisms are just algorithms, they can be replaced by more efficient algorithms, not characterized by the vulnerability of biological organisms. However, this religious revolution is supposed to happen in a world where of 6.9 billion people on the earth, only 11.5% declare themselves to be without a religion. The rest are Christians, Muslims, Hindus, Buddhists, Jews or belong to some other religion. What can the old religions offer as a critique of the new religion of Dataism? What have the Gods of the old religions have to say about the gods of the fourth industrial revolution?

There are two new religions that Harari sees on the horizon of the future. He does not believe that there is much to be expected from the old religions. They have contributed to the progress of humanity, but the process has gone ahead, leaving them behind. Therefore, "the most interesting place in the world from a religious perspective is not the Islamic State or the Bible Belt, but Silicon Valley". (HD 409) And he goes on: "That's where hi-tech gurus are brewing for us brave new religions that have little to do with God and everything to do with technology." (HP 409) This judgment seems to me to be based on a category mistake. The religions do not contribute to our knowledge of facts, of logical or physical rules or to our knowledge of meanings, rather they provide a framework

5) Cf. Lewis, C.S., *The Abolition of Man*, originally published 1943; new edition: Grand Rapids: HarperOne, 2015.

of orientational beliefs in which these facts, rules and meanings can be questioned as to whether they make sense. By being placed within this framework their ontological implications become apparent and can be critically assessed in intellectual debate. Therefore the old religions are certain to raise questions about the gods of the fourth industrial revolution: Where do they stand with regard to the ontological divide of creator and creature? If they are just the products of the ingenious minds of creatures they will continue to presuppose something that they have not created but that was simply given to them. The old religions would want to insist that no human creativity is unconditional, even if it is genetically or algorithmically enhanced. The old religions would certainly want to ask whether the Internet of all things is not just another Tower of Babel bringing not the aspired unity of humankind but disruption and dispersion. The old religions would certainly want to question the aims of the new agenda of humanity. Does non-mortality really overcome death or does it just present us with the tedium of a very long, probably painful and, in the long run, nevertheless mortal life? They would also want to raise the question whether the limited time-scale that humans have at their disposal is not also the condition for finding anything meaningful just because it is an unrepeatable unique experience, at least to a mind that has not only intelligence but also consciousness. The old religions (and here we would indeed have grand coalition of all world religions) would certainly question whether the happiness that can be chemically induced is indeed true happiness, the flourishing and the fulfilment of the human destiny. Does that really go to the root of human unhappiness? This is a question Buddhists as well as Jews. Christians as well as Muslims would want to ask. And certainly the Gods of the old religion would smile down at the little created over-achiever who claims that he has achieved divinity by upgrading human nature. In the name of the Christian God Christian theologians would certainly want to insist the only way that humans could achieve divinity is not by humans working their way through a series of upgrades into heaven but by being united to the one “who came down from

heaven and became man", precisely "for us and our salvation", to liberate us from the futile attempts to divinize ourselves step by step in order to become to be more than human, ending up being less than human. Harari states: "Just as free-market capitalists believe in the invisible hand of the market, so Dataists believe in the invisible hand of the dataflow." (HP 440) People still allied to the old religions would want to ask: Given your experiences with the invisible hand of the market, would you really want to believe in the invisible hand of the dataflow? After all, it is the invisible hand of the dataflow that can seriously paralyse the invisible hand of the market, as the story of flash crash of 2010 tells us, a disaster that could only be remedied by taking the human decision to suspend all electronic trading for five seconds.[6)]

4. Deep Learning and the "Dimension of Depth" of Human Learning

7) Harari presents his account of the possibilities of the history of tomorrow in order to allow us to reflect on these developments and consider possibilities of redirecting them in constructive ways (HP 461). This is only possible when the distinction between natural and artificial intelligence as one between natural, embodied, emotionally connected intelligence (consciousness) and artificial forms of intelligence is maintained. The case of deep learning in artificial neural networks is the most interesting case since it copies the archetype (the human brain) more closely than big data processing machines because of the layers between input and output, mirroring the network structures of the human brain. Just because of that artificial neural networks might indeed be seen as being able to replace natural intelligence in important respects. Replacement, the dependence of natural intelligence on artificial intelligence and problems of responsibility, liability including cases of litigation (robots, autonomous vehicles) will pose the biggest problems in the future. These problems will be worked on more

6) The full story is told in Kaplan, J., *Humans Need not Apply*, New Haven: Yale UP, 2015, 59-76 under the heading "The Gods are Angry".

easily in a dialogue between the sciences and the humanities which use the wisdom of the religions as resources for dealing with the problems that we will most probably encounter. These resources will also be helpful to reflect on and assess the social consequences of the introduction of interaction partners equipped with artificial intelligence. Religious wisdom represents the dimension of depth of human wisdom.

In order to assess the scenarios that Harari paints the case of "Deep learning", of learning in artificial neural networks, is certainly one of the most interesting. The old puzzle of artificial intelligence revolves around the question whether the difference between natural intelligence (or created intelligence as one would say theologically) as the archetype and artificial intelligence (as humanly constructed intelligence) as the copy can be maintained in the interactions between human and synthetic intellects. Is there not a danger of synthetic intellects replacing human intellects so that the intelligence needed for the development, maintenance and correction of artificial intelligence is no longer sufficiently cultivated? And if so, then human intellects have become dependent on synthetic intellects in such a way that corrective interventions in synthetic intellects will become, at least, increasingly difficult. The case of deep learning is therefore so interesting because it manifests, on the one hand, the dependence of artificial neural networks on the human brain and so presupposes a clear difference; on the other hand, once artificial neural networks work on a large scale, maintaining the difference will become a problem. Where will adjustments have to be made in the interplay between natural and artificial intelligence?

If one looks at the problem quite pragmatically, one can, I think, safely assume that the adjustments will revolve around the problem of responsibility. Who is to blame if a sophisticated robot, in spite of having been programmed also with moral codes, misjudges a situation and commits a misdemeanour or even a felony? Kaplan describes such a case under the heading "Officer, Arrest that Robot". Who is responsible in such a case? The robot? You as the owner of the robot who gave it a particular order?

The programmers, the software designers or the hardware engineers of the robot? Another example which is already happening on the streets of the United States is the question who is responsible if an autonomous car causes a crash? My prediction would be that cases such as these will, through the need to clarify questions of responsibility, liability and the questions of litigation involved, lead to debates on whether legislation about the use of artificial intelligence not only with regard to robots will have to be introduced.

My advice would be that such questions should not be left to the legal profession but should be the topic for open dialogues, not only for the software engineers and lawyers, but for the whole of society. It would be desirable if such dialogues would include the humanities and also the religious traditions. Their wisdom represents what Paul Tillich has called the "dimension of depth" where the nature of responsibility is not only discussed in its "horizontal" dimensions but also in its "vertical dimension", the dimension of the Ultimate over against and in relation to all the practical questions. Including the traditions of religious wisdom in these debates would shift the focus from intellect to consciousness and to the ground of responsibility for one another and before God. This would not so much change our views of synthetic intellects but it would change our views of the human beings involved in interaction with synthetic intellects. It would question the reductionist views being transferred from artificial intelligence to humans. Consciousness is far more than data processing, and the dialogue of embodied persons involves more than the exchange of algorithms. This would mean to counter the reductionist views that x (consciousness, the mind, the person, the body etc.) is nothing more than or nothing but by the non-reductionist, if you want, excessive view that x is certainly more than. It seems that respect for the dignity of the human person was always dependent on insisting on this *more than* - not only in the fourth industrial revolution, but already in the first, the second and the third. The language of God in theology and philosophy is the reminder of this dimension of depth, the certainly more than, which will be needed in our future dialogues.

8) Of the world religions Buddhism seems to have the least problems with notions of a decentred intelligence and therefore there is in some quarters lively interaction between the neurosciences and Buddhist thinkers on the basis of the anattā-doctrine. For Buddhists the main criticism seems to be directed at the human desires driving the technological advances of the fourth industrial revolution. For Judaism, Christianity and Islam the problem of responsibility before God for who humans are and what they do is absolutely crucial. The belief in God the creator implies for Christians a special dignity of the human creature, equally shared by all humans, which excludes that humans can become their own field of creative experimental self-creation. The awareness of the estrangement of humans from their creator engenders a realistic picture of the fallibility and even fallenness of humans. And perhaps most importantly, human creatures are to be perfected by God in communion with God. Self-perfection is, if at all, the characteristic of estrangement from God, so that until the coming of the Kingdom of God we remain bound to manage our imperfection. Perhaps the most characteristic difference to the ideal of the Homo Deus in the fourth industrial revolution is that the only Homo Deus, Jesus Christ, is the image of a truly human human being.

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Abstract

The Gods of the Fourth Industrial Revolution
-Philosophies and Religions in the Age of Deep Learning-

Christoph Schwöbel

Reading the signs of the times has been regarded as a central task for all religions, perhaps especially for those religions which are directed towards an end of history. Klaus Schwab characterized emerging technologies that bridge the gap between animals and machines as the "the fourth industrial revolution". The industrial revolutions are accompanied by philosophies and had a significant effect on the traditional religions. The "market" and "the individual" are the God of third industrial revolution, and the task of the traditional religions is to offer a theological critique of these quasi-religions as forms of idolatry. Artificial Intelligence with deep learning might indeed be seen as being able to replace natural intelligence, but these problems will be worked on more easily in a dialogue between the sciences and the humanities which use the wisdom of the religions as resources for dealing with the problems. Therefore the most important thing is that human creatures are to be perfected by God in communion with God.

【Key words】 Industrial Revolution, the Fourth Industrial Revolution, Traditional Religions, Deep Learning, Artificial Intelligence